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(54) EMERGENCY ACCIDENT INFORMING SYSTEM CAPABLE OF PERFORMING
SIMULTANEOUS COMMUNICATION BY DATA/VOICE OR SWITCHING
COMMUNICATION

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an
emergency accident information system which is
capable of informing detailed content of an accident
to an emergency aid center.SOLUTION: When an emergency occurs in a vehicle
due to accident, etc., the detailed content of the
accident is notified to an emergency aid center by

first executing the position information of own vehicle, accident information, and furthermore, such emergency information as vehicle ID and crew ID information, etc., stored in advance are notified through radio data communication by a first radio transmission means 33, and automatically switching the data communication to voice communication by a second radio transmission means 35, when the data communication is completed.

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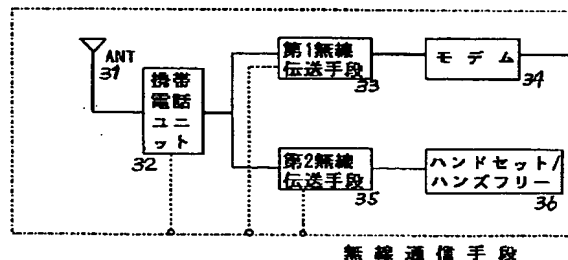
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(54) 【発明の名称】 データ/音声の同時通信または通信切替え可能な事故緊急通報システム

(57) 【要約】

【課題】 詳しい事故内容を緊急救援センタに知らしめることができる事故緊急通報システムを提供する。

【解決手段】 事故等で車両に緊急事態が発生した場合には、まず第1の無線伝送手段33により自車の位置情報と事故情報、さらには予め記憶させてある車両ID、乗員ID情報等の緊急情報を緊急救援センタに無線によるデータ通信により実施し、そして、そのデータ通信終了時に第2の無線伝送手段35により自動的に音声通信に切り替えて、詳しい事故内容を緊急救援センタに知らしめる。



【特許請求の範囲】

【請求項 1】 重力加速度や自車の傾き等のセンサにより自車の事故を検出する事故検出手段と、GPSやジャイロ、車速センサ等のセンサ情報から自車の位置を特定する自車位置特定手段と、前記した自車の位置情報と事故情報、さらには予め記憶させてある車両 ID、乗員 ID 情報等の緊急情報を後記する緊急救援センタに無線で通信するための無線通信手段または、データと音声と同時に伝送することができるデータ/音声同時伝送手段とを少なくとも有する車両と、前記緊急情報を受けてその内容に基づき前記車両の置かれている場所に緊急自動車の出動要請を行なう緊急救援センタとから成る事故緊急通報システムであって、前記無線通信手段は、事故発生時に前記車両から前記緊急救援センタに緊急情報をデータ通信にて伝送する第 1 の無線伝送手段と、前記第 1 の無線伝送手段によるデータ通信終了時に自動切替えによって前記車両から前記緊急救援センタに音声通信を可能とする第 2 の無線伝送手段またはデータ/音声同時伝送手段を少なくとも有することを特徴とする事故緊急通報システム。

【請求項 2】 データ通信及び音声通信中は、前記緊急救援センタ主導で回線の切断制御を行なうことを特徴とする請求項 1 に記載の事故緊急通報システム。

【請求項 3】 前記第 2 の無線伝送手段による音声通信中に新たなプライオリティの高いデータ通信要求が発生したならば前記第 2 の無線伝送手段による音声通信を中断し、前記第 1 の無線伝送手段によるデータ通信を可能とするように構成したことを特徴とする請求項 1 に記載の事故緊急通報システム。

【請求項 4】 前記データ/音声同時通信手段として、周波数分割多重または時分割多重または空間分割多重（スプレッドスペクトラム方式）によって、データ通信中に音声通信をも同時伝送するように構成したことを特徴とする請求項 1 に記載の事故緊急通報システム。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は事故緊急通報システムに係わり、特にデータ通信による緊急情報の送信後、自動切替えによって音声通信を行ったり、もしくはデータ/音声同時通信を可能とするよう構成したものである。

【0002】

【従来の技術】従来、自動車等の車両の事故等で運転者による外部との通信が不可能となった場合でも、異常発生を車両の位置とともに外部に伝達することができる緊急通報システムが特開平 9-198592 に開示されている。それによれば、GPS からの位置情報を基に自己位置を計測する航法システムを用いて所定時間毎に自己位置を計測してその計測値と計測時刻とを記憶手段に記憶し、車両の異常が異常検出手段で検出された時に記憶

手段に記憶した最新の計測値と計測時刻とを基に作成した異常発生メッセージを予め定められた受信装置に無線公衆電話回線を経由して送出するよう構成している。

【0003】このシステムは、自己位置データと自己位置を記憶した時刻データとを基に作成した最新の異常発生メッセージを所定の通報先にデータ通信するだけで詳しい事故内容を正確に知らしめることができないという問題があった。

【0004】

10 【発明が解決しようとする課題】そこで、本発明の目的は上記の問題点を解消し、事故等で車両に緊急事態が発生した場合には、まず自車の位置情報と事故情報、さらには予め記憶させてある車両 ID、乗員 ID 情報等の緊急情報を緊急救援センタに無線によるデータ通信を行ない、そのデータ通信終了時に自動的に音声通信に切り替えて、もしくはデータ/音声同時通信手段を使用して、詳しい事故内容を緊急救援センタに知らしめることができる事故緊急通報システムを提供することにある。

【0005】

20 【課題を解決するための手段】本発明による事故緊急通報システムは、重力加速度や自車の傾き等のセンサにより自車の事故を検出する事故検出手段と、GPSやジャイロ、車速センサ等のセンサ情報から自車の位置を特定する自車位置特定手段と、前記した自車の位置情報と事故情報、さらには予め記憶させてある車両 ID、乗員 ID 情報等の緊急情報を後記する緊急救援センタに無線で通信するための無線通信手段または、データと音声を同時に伝送することができるデータ/音声同時伝送手段とを少なくとも有する車両と、前記緊急情報を受けてその内容に基づき前記車両の置かれている場所に緊急自動車の出動要請を行なう緊急救援センタとから成る事故緊急通報システムであって、前記無線通信手段は、事故発生時に前記車両から前記緊急救援センタに緊急情報をデータ通信にて伝送する第 1 の無線伝送手段と、前記第 1 の無線伝送手段によるデータ通信終了時に自動切替えによって前記車両から前記緊急救援センタに音声通信を可能とする第 2 の無線伝送手段を少なくとも有することを特徴とする。

30 【0006】さらに、データ/音声同時伝送手段を備えることにより上記データ通信と上記音声通信を同時並行的に行なえるようにしたことを特徴とする。

40 【0007】このような構成を有することにより、まず緊急情報が無線によるデータ通信にて伝送され、ついで音声通信に自動切り替えまたはデータ/音声同時通信が行なわれるので、詳しい事故内容を正確に知らしめることができるとともに、最悪の状態でもデータ通信による緊急情報が緊急救援センタに伝送されるので、より迅速・的確な救助・支援の体制を組むことができる。

【0008】

50 【発明の実施の形態】本発明の請求項 1 に記載の発明

は、重力加速度や自車の傾き等のセンサにより自車の事故を検出する事故検出手段と、GPSやジャイロ、車速センサ等のセンサ情報から自車の位置を特定する自車位置特定手段と、前記した自車の位置情報と事故情報、さらには予め記憶させてある車両ID、乗員ID情報等の緊急情報を後記する緊急救援センタに無線で通信するための無線通信手段または、データと音声と同時に伝送することができるデータ/音声同時伝送手段とを少なくとも有する車両と、前記緊急情報を受けてその内容に基づき前記車両の置かれている場所に緊急自動車の出動要請を行なう緊急救援センタとから成る事故緊急通報システムであって、前記無線通信手段は、事故発生時に前記車両から前記緊急救援センタに緊急情報をデータ通信にて伝送する第1の無線伝送手段と、前記第1の無線伝送手段によるデータ通信終了時に自動切替えによって前記車両から前記緊急救援センタに音声通信を可能とする第2の無線伝送手段を少なくとも有することを特徴とする事故緊急通報システムとしたものであり、詳しい事故内容を正確に知らしめることができるとともに、最悪の状態でもデータ通信による緊急情報が緊急救援センタに伝送しうろという作用を有する。

【0009】また、請求項2に記載の発明は、データ通信及び音声通信中は、前記緊急救援センタ主導で回線の切断制御を行なうことを特徴とする請求項1に記載の事故緊急通報システムとしたものであり、接続された回線を緊急通報装置側からは切断制御を行なうことができないように緊急救援センタ主導で回線の切断制御を行なうことができるという作用を有する。

【0010】また、請求項3に記載の発明は、前記第2の無線伝送手段による音声通信中に新たなプライオリティの高いデータ通信要求が発生したならば前記第2の無線伝送手段による音声通信を中断し、前記第1の無線伝送手段によるデータ通信を可能とするように構成したことを特徴とする請求項1に記載の事故緊急通報システムとしたものであり、音声通信に切り替えられた後でも新たに招来した事態に対してデータ通信に再切替えを行なうことができるという作用を有する。

【0011】また、請求項4に記載の発明は、前記データ/音声同時通信手段として、周波数分割多重または時分割多重または空間分割多重（スプレッドスペクトラム方式）によって、データ通信中に音声通信をも同時伝送するように構成したことを特徴とする請求項1に記載の事故緊急通報システムとしたものであり、データ通信から音声通信への切り替えに際し運転者の意志で音声通信を素早く開始することができるという作用を有する。

【0012】以下、本発明の実施の形態について、図面に基づき説明する。

【0013】図1は本発明の各実施の形態に係る事故緊急通報システムの概略構成を示すブロック図である。図1において、事故緊急通報システムは、少なくともGP

Sから自車の位置情報を得て記録するようにした緊急通報装置を搭載した車両1が事故発生時にネットワーク（基地局、交換網）を介して緊急救急センタ2に通報できるように構成されている。緊急救急センタ2は、車両1からの通報に基づいて事故の状況を把握し、病院の手配や、最寄りの警察署及び消防署から現場に緊急車両の出動を要請して、事後処理を依頼する。また、緊急救急センタ2は、車両の所有者と契約によって緊急救援サービスを提供するようにしているので、車両2に関して少なくとも車両2の安全確認のデータ交信を自動的にデータ通信により行なうようにしている。

【0014】図2は、緊急通報装置を搭載した車両の構成の概要を示すものである。図2において、重力加速度や自車の傾き等のセンサにより自車の事故を検出する事故検出手段21と、GPSやジャイロ、車速センサ等のセンサ情報から自車の位置を特定する自車位置特定手段22と、前記した自車の位置情報と事故情報、さらには予め記憶させてある車両ID、乗員ID情報等の緊急情報を緊急救援センタに無線で通信するための無線通信手段23又はデータ/音声同時通信手段27、ROMやRAMを含む記憶手段24、CPU25、電源26を備えている。

【0015】（第1の実施の形態）以上のような事故緊急通報システムおよび緊急通報装置を搭載した車両の構成において、本発明の第1の実施の形態について説明する。図3に示されるように無線通信手段は、アンテナ31と通常の携帯電話ユニット（送受信部、アンテナ部を除く送受信に係る携帯電話本体部）32を備えており、更には、携帯電話ユニット32とは、切替スイッチ（後記する）を介してモデム34を接続させる第1の無線伝送手段33と、切替スイッチ（後記する）を介してハンドセット（又はハンドフリー）36と接続させる第2の無線伝送手段35を備えている。なお、図3において、点線は緊急通報装置の中のCPUによって制御されることを示している。

【0016】図4は、本発明の第1の実施の形態に係る緊急通報装置の構成並びに上記した無線通信手段の構成をより詳細に示したものである。図4において、無線通信手段の切替えスイッチの部分及びモデム部分が緊急通報装置の中に含まれているが、その他は、緊急通報装置の外に設けられている。そして、緊急通報装置には、CPU41、フラッシュROM42、RAM43、ジャイロセンサ44、GPSレシーバ45、ロールオーバーセンサ46、電源供給部47、モデム48、切替えスイッチ49、エコーキャンセラ50が設けられている。また、CPU41には、キースイッチのON/OFF情報、クラッシュセンサの情報、速度センサの情報などが入力されるようになっている。

【0017】図5は、本発明の実施の形態に係る緊急救援センタの概略構成を示すものであり、緊急救援センタには、通信手段51と、通信制御手段52と、データベース53と、表示/通話手段54が備えられており、通信制御手

段52はLANを介してデータベース53および表示／通話手段54とデータのやりとりができるようにされている。通信手段51は、交換機を含み、通信制御手段52には、リンクを介して接続及び接続制御されるようになってい

る。データベース53は、車両の所有者などについての顧客管理データ、地図データ、緊急呼に関するデータ等を蓄積・保有しているものである。
【0018】通信手段(交換機)51は、コモンキャリアの提供する公衆有線回線、公衆無線回線などを經由して車両と接続され、車両からの緊急情報の受信が可能になっている。通信制御手段52は、車両からの緊急情報の受信時にその緊急情報を解読して時刻データ／位置データ、事故情報、さらには予め記憶させてある車両ID、乗員ID情報などを取り出し、事故の発生をオペレータが在席する表示／通話手段54に通知すると共に、データベース53より取り出した地図データとマップマッチングを行なって表示／通話手段54に表示する。オペレータは、表示された事故の内容を見て、緊急自動車の出動要請、救急病院の手配など、迅速な救急支援体制を組むことができる。

【0019】次に、本発明の第1の実施の形態の事故緊急通報システムの動作を説明する。

【0020】図2の自車位置特定手段22は、図4に図示されるようにGPSレシーバ45においてGPSから定期的に位置情報を取得すると同時に時刻情報を取得して、緊急通報装置内のフラッシュROM42に記憶する。図2の事故検出手段21は、車両1に重力加速度が加わることによるクラッシュセンサの作動や車両1の必要以上の傾きをロールオーバーセンサ46がセンサすることなどにより、事故の発生を検出し、その事故発生を緊急通報装置のCPU41に通知するとともにそれをフラッシュROM42に記憶する。

【0021】事故発生の通知を受けた緊急通報装置のCPU41は、図3の第1の無線伝送手段33を動作させてフラッシュROM42に事故に関して記憶した情報、即ち車両1の位置情報と、時刻情報と、各種センサからの事故内容を表すセンサ情報、更には予めフラッシュROM42に記憶されて車両ID、乗員ID情報等を読み出すと同時に所定の伝送フォーマットにすると共に切替スイッチ49をモデム側に切替えて携帯電話ユニットとモデム48とを接続させて、アンテナTELを介して公衆回線経由で緊急情報として緊急救援センタ2に向けてデータ通信形式で伝送する。

【0022】データ通信形式の緊急情報のデータ伝送の終了を緊急救援センタ2の通信制御手段52が検出すると、車両1に対してデータを受領したことを示すACKを返送する。これにより車両1の緊急通報装置のCPU41は、図3の第2の無線伝送手段35を動作させて切替スイッチ49をハンドセットまたはハンドフリーに自動的に切替えるとともに、携帯電話ユニットとハンドセット

又はハンドフリーとを接続させて音声通信を開始する。

【0023】これにより、音声通信形式で車両内の乗員と緊急救援センタ2の表示／通話手段54に在席するオペレータとの間で通話できるようにする。

【0024】以上についての通信シーケンスを図示すれば、図6のように表すことができるものである。

【0025】音声通信形式による音声通信の最中、新たなプライオリティの高い事態の発生によりデータ通信すべき状態が検出されたならば、緊急通報装置のCPU41は、再度第1の無線伝送手段33を動作させてデータ通信形式で緊急情報を再度伝送することもできる。

【0026】緊急救援センタ2では、データ通信形式で伝達された緊急情報を通信手段51たる交換機を経て交換機を制御する通信制御手段52で受信する。通信制御手段52は、まずデータ通信形式で伝達された緊急情報を解読して、事故の内容を特定するとともに、回線の切断制御を通信制御手段52主導で行なえるように制御する。その後で、事故が発生した車両の現在位置、時刻、事故センサの作動状況、車両ID、乗員ID等を解読して、それをデータベース53からの地図データ上にマップマッチングさせながら表示／通話手段54に表示する。

【0027】ついで、データ通信形式の終了を通信制御手段52にて検出し、緊急救援センタ側から車両側へACKを返送する。このACKを車両側のCPU41が検出して、車両側では第2の無線伝送手段35を動作させて音声通信に自動切替えを行なう。また、緊急救援センタ側では、通信手段51が内線に切り替えてオペレータ電話機にて音声通信形式による通話を車両の乗員と実施する。車両の乗員との間で音声通話が自動的にできるようになるので事故状況の補完をすることができ、より正確な事故状況の把握を行なうことができる。

【0028】上記のようにして事故状況を把握した緊急救援センタのオペレータは、表示／通話手段54に表示された内容を見て、通信手段51を介して車両の置かれている場所に、パトカーや救急車等の緊急自動車の出動要請を行なうと共に2次災害の発生防止や病院の手配等を行なう。

【0029】(第2の実施の形態)本発明の第2の実施の形態について、以下、図面に基づき説明する。事故緊急通報システム、緊急通報装置を搭載した車両および緊急救援センタの構成については、すでに説明してあるので、ここでは再説明しない。なお、第1の実施の形態と同一の構成については、説明を省略する。

【0030】図7に示されるようにデータ／音声同時通信手段は、アンテナ31と通常の携帯電話ユニット(送受信部、アンテナ部を除く送受信に係る携帯電話本体部)32を備えており、更には、携帯電話ユニット32とは、データ／音声同時伝送手段37を介して速度変換・コマンド処理部38に接続され、また、データ／音声同時伝送手段37を介してハンドセット(又はハンドフリー)36と接続

できる。

【0031】データ／音声同時通信を実現する手法はいろいろあるが、いくつかの例について簡単に説明する。第1の手法としては、周波数分割多重方式がある。この方式は、さらに(a)DTMF方式と、(b)FSK方式とに分けられている。そして、(a)DTMF方式は、通常の音声伝送モード中に、DTMF(Dual Tone Multi-Frequency)により、低速度でデータ伝送を重畳するものである。一方、(b)FSK方式は、通常の音声伝送モード中に、FSK(Frequency Shift Keying)により、低速度のデータ伝送を重畳するものである。

【0032】次に第2の手法としては、時分割多重方式がある。この方式は、たとえば、データ伝送速度として9600bitsのデータを伝送することができる回線を、データと音声とで4800bitsずつに分割して使用することで実現する。この場合、音声伝送のために4.8kb/s程度の低ビットレートのCODEC(符号化／復号化器)を必要とすることは勿論である。また、音声通話は、一般的に約1／3しか占有していないので、残りの約2／3は無音時間があるので、その時間にもデータ伝送を行なうようにすることもできるが、無音時間は一定ではないので、フロー制御等の速度整合処理が必要となり、そのために音声部分にて無音検出部を設けたり、速度整合・コマンド処理部をデータ伝送部に設ける必要がある。

【0033】さらに第3の手法としては、空間分割多重(スプレッドスペクトラム方式)方式がある。この方式は、通常では、CDMA方式として携帯電話方式ですでに実現されているものであり、伝送帯域が飛躍的に向上できるので、データ／音声のみならず画像データをも伝送できるようになる。

【0034】なお、上記した“コマンド処理”とは、一般的にはMODEMに搭載されているATコマンド等の伝送速度、誤り検出訂正方式、フロー制御の方式等のMODEMの動作モードをコマンドにより制御するための処理のことと、この処理自体はよく知られているものである。

【0035】図8は、本発明の第2の実施の形態に係る緊急通報装置の構成並びに上記したデータ／音声同時通信手段の構成をより詳細に示したものである。図8において、データ／音声同時伝送手段、切替えスイッチ及び速度変換・コマンド処理部が緊急通報装置中に含まれているが、その他は、緊急通報装置の外に設けられている。そして、緊急通報装置には、CPU41、フラッシュROM42、RAM43、ジャイロセンサ44、GPSレシーバ45、ロールオーバーセンサ46、電源供給部47、エコーキャンセル48、データ／音声同時伝送手段55、速度変換・コマンド処理部56が設けられている。また、CPU41には、キースwitchのON/OFF情報、クラッシュセンサの情報、速度センサの情報などが入力されるようになっている。

【0036】次に、本発明の第2の実施の形態の事故緊

急通報システムの動作を説明する。

【0037】図2の自車位置特定手段22は、図8に図示されるようにGPSレシーバ45においてGPSから定期的に位置情報を取得すると同時に時刻情報を取得して、緊急通報装置内のフラッシュROM42に記憶する。図2の事故検出手段21は、車両1に重力加速度が加わることによるクラッシュセンサの作動や車両1の必要以上の傾きをロールオーバーセンサ46がセンスすることなどにより、事故の発生を検出し、その事故発生を緊急通報装置のCPU41に通知するとともにそれをフラッシュROM42に記憶する。

【0038】事故発生の通知を受けた緊急通報装置のCPU41は、図7の速度変換・コマンド処理部38を動作させてフラッシュROM42に事故に関して記憶した情報、即ち車両1の位置情報と、時刻情報と、各種センサからの事故内容を表すセンサ情報、更には予めフラッシュROM42に記憶されて車両ID、乗員ID情報等を読み出すと同時に携帯電話ユニットと速度変換・コマンド処理部38とを接続させて、アンテナTELを介して公衆回線経由で緊急情報として緊急救援センタ2に向けてデータ通信形式で伝送する。

【0039】データ通信形式の緊急情報のデータ伝送の終了を緊急救援センタ2の通信制御手段52が検出すると、車両1に対してデータを受領したことを示すACKを返送する。これにより車両1の緊急通報装置のCPU41は、図7のハンドセットまたはハンドフリーに自動的に切替えるとともに、携帯電話ユニットとハンドセット又はハンドフリーとを接続させて音声通信を開始する。

【0040】これにより、音声通信形式で車両内の乗員と緊急救援センタ2の表示／通話手段54に在席するオペレータとの間で通話できるようにする。

【0041】以上についての通信シーケンスを図示すれば、すでに説明した図6のように表すことができるものである。

【0042】音声通信形式による音声通信の最中、新たなプライオリティの高い事態の発生によりデータ通信すべき状態が検出されたならば、緊急通報装置のCPU41は、速度変換・コマンド処理部38を動作させてデータ通信形式で緊急情報を再度伝送することもできる。

【0043】緊急救援センタ2では、データ通信形式で伝達された緊急情報を通信手段51たる交換機を経て交換機を制御する通信制御手段52で受信する。通信制御手段52は、まずデータ通信形式で伝達された緊急情報を解読して、事故の内容を特定するとともに、回線の切断制御を通信制御手段52主導で行なえるように制御する。その後で、事故が発生した車両の現在位置、時刻、事故センサの作動状況、車両ID、乗員ID等を解読して、それをデータベース53からの地図データ上にマップマッチングさせながら表示／通話手段54に表示する。

【0044】ついで、データ通信形式の終了を通信制御

手段52にて検出し、緊急救援センタ側から車両側へACKを返送する。このACKを車両側のCPU41が検出して、車両側では第2の無線伝送手段35を動作させて音声通信に自動切替えを行なう。また、緊急救援センタ側では、通信手段51が内線に切り替えてオペレータ電話機にて音声通信形式による通話を車両の乗員と実施する。車両の乗員との間で音声通話が自動的にできるようになるので事故状況の補完をすることができ、より正確な事故状況の把握を行なうことができる。

【0045】上記のようにして事故状況を把握した緊急救援センタのオペレータは、表示／通話手段54に表示された内容を見て、通信手段51を介して車両の置かれている場所に、パトカーや救急車等の緊急自動車の出動要請を行なうと共に2次災害の発生防止や病院の手配等を行なう。

【0046】なお、上記した第1および第2の実施の形態では、図2に示した予め記憶させてある車両ID、乗員ID情報等の緊急情報を緊急救援センタに無線で通信するための無線通信手段23およびデータ／音声同時通信手段27は、択一的に備えるものについて説明したが、上記2つの通信手段を同時に備え、モード変更によりそのどちらでも自由に選択できるようにしてもよい。

【0047】

【発明の効果】以上説明したように本発明の事故緊急通報システムによれば、詳しい事故内容を正確に知らしめることができるとともに、最悪の状態でもデータ通信による緊急情報が緊急救援センタに伝送するという効果がある。

【0048】また、本発明の事故緊急通報システムによれば、音声通信に切り替えられた後でも新たに招来した事態に対してデータ通信に再切替えを行なうことができるという効果がある。

【0049】また、本発明の事故緊急通報システムによれば、データ通信と音声通信を同時に実施することができるので新たに招来した事態に対して音声通信にて素早く対応することができるという効果がある。

【図面の簡単な説明】

【図1】本発明の各実施の形態の事故緊急通報システムの概略構成を示すブロック図、

【図2】本発明の各実施の形態に係る緊急通報装置を搭載した車両の構成の概要を示すブロック図、

【図3】本発明の第1の実施の形態に係る無線通信手段の構成を示すブロック図、

【図4】本発明の第1の実施の形態に係る緊急通報装置の構成並びに無線通信手段の構成をより詳細に示した構成ブロック図、

【図5】本発明の各実施の形態に係る緊急救援センタの概略構成を示すブロック図、

【図6】本発明の各実施の形態に係る緊急通報装置と緊急救援センタとの間の通信シーケンスを示す図、

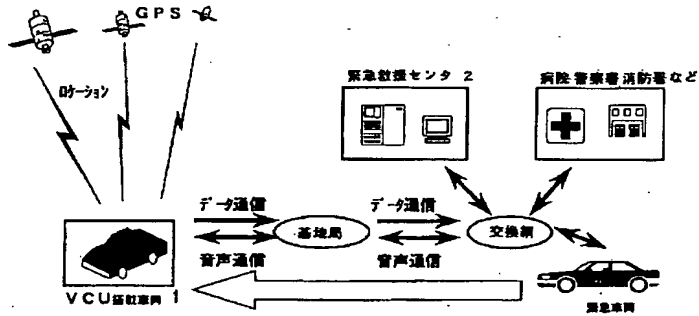
【図7】本発明の第2の実施の形態に係るデータ／音声同時通信手段の構成を示すブロック図、

【図8】本発明の第2の実施の形態に係る緊急通報装置の構成並びにデータ／音声同時通信手段の構成をより詳細に示した構成ブロック図である。

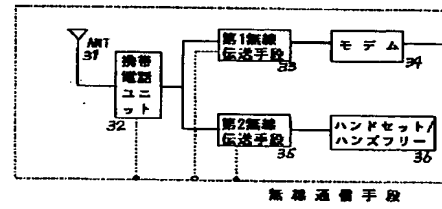
【符号の説明】

- 1 緊急通報装置を搭載した車両
- 2 緊急救援センタ
- 21 事故検出手段
- 22 自車位置特定手段
- 23 無線通信手段
- 24 記憶手段
- 25、41 CPU
- 26 電源
- 27 データ／音声同時通信手段
- 31 ANT
- 32 携帯電話ユニット
- 33 第1の無線伝送手段
- 34、48 モデム
- 35 第2の無線伝送手段
- 36 ハンドセット／ハンズフリー
- 37、55 データ／音声同時伝送手段
- 38、56 速度変換・コマンド処理部
- 42 フラッシュROM
- 43 RAM
- 44 ジャイロセンサ
- 45 GPSレシーバ
- 46 ロールオーバーセンサ
- 47 電源供給部
- 49 切替えスイッチ
- 50 エコーキャンセラ
- 51 通信手段
- 52 通信制御手段
- 53 データベース
- 54 表示／通話手段

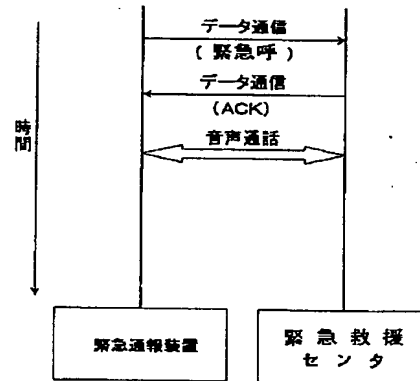
【図1】



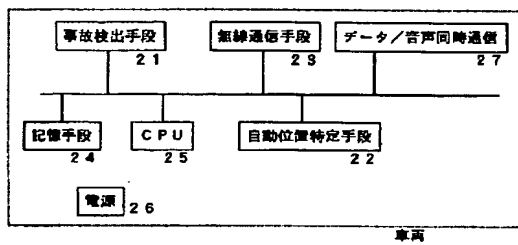
【図3】



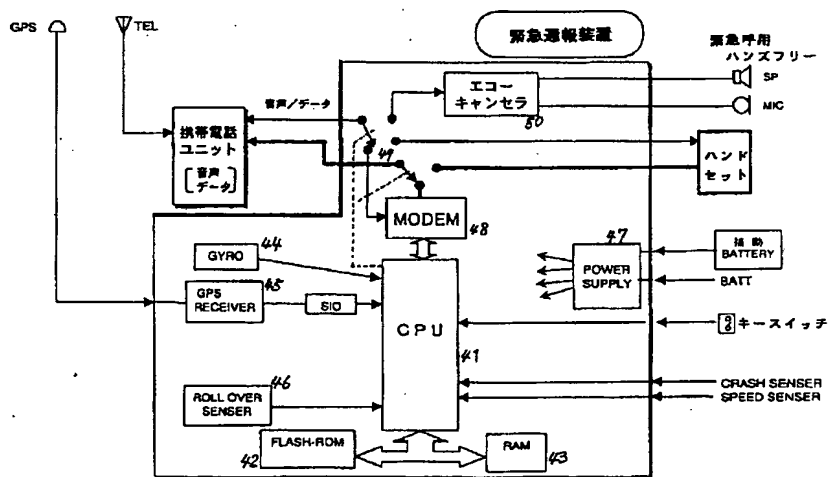
【図6】



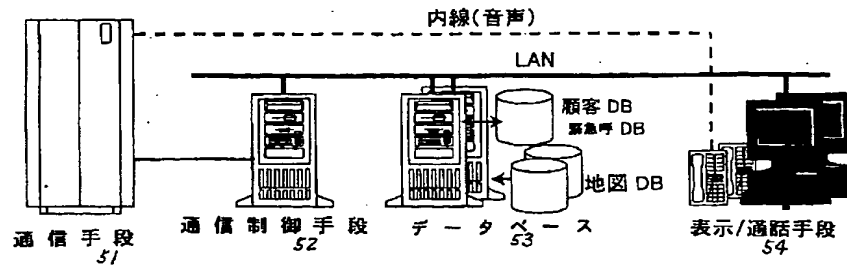
【図2】



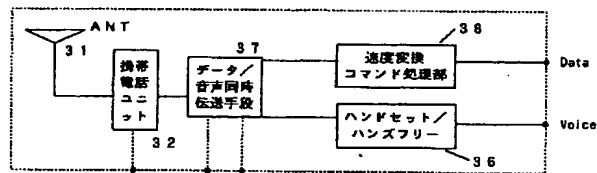
【図4】



【図5】

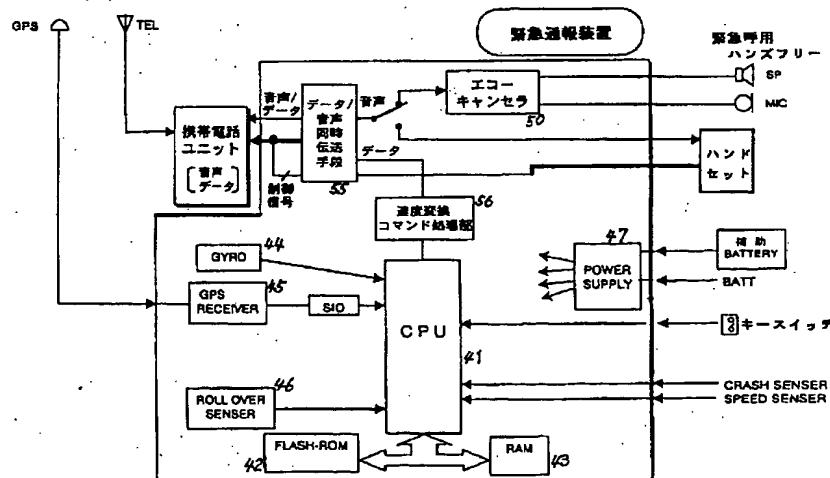


【図7】



データ/音声同時通信手段

【図8】



フロントページの続き

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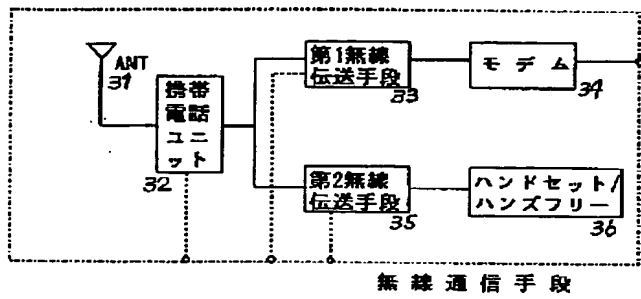
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- 3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] With respect to an accident emergency reporting system, after transmission of the emergency intelligence by data communication, especially this invention performs speech communication by automatic change, or it constitutes it so that data / voice broadcast may be made possible.

[0002]

[Description of the Prior Art] Even when communication with the exterior by the operator becomes impossible in the accident of vehicles, such as an automobile, etc. conventionally, the emergency reporting system which can transmit a heterology outside with the position of vehicles is indicated by JP,9-198592,A. According to it, measure a self-position for every predetermined time using the navigation system which measures a self-position based on the positional information from GPS, and the measurement value and measurement time are memorized for a storage means. When the abnormalities of vehicles are detected with a malfunction detection means, it constitutes so that the heterology message created based on the newest measurement value and newest measurement time which were memorized for the storage means may be sent out to the receiving set which was able to be defined beforehand via a radio dial-up line.

[0003] This system had a problem of the ability not to make the detailed content of accident know correctly only by carrying out data communication of the newest heterology message created based on the time data which memorized self-position data and the self-position to a predetermined information addressee.

[0004]

[Problem(s) to be Solved by the Invention] then, when the purpose of this invention cancels the above-mentioned trouble and emergency occurs on vehicles in accident etc. First The positional information of a self-vehicle, accident information, the vehicles ID made to have memorized further beforehand Perform data communication according emergency intelligence, such as crew ID information, to radio in the emergency relief center, and change to speech communication automatically at the time of the data communication end, or data / voice broadcast means is used. It is in offering the accident emergency reporting system which can make an emergency relief center know the detailed content of

accident.

[0005]

[Means for Solving the Problem] An accident detection means by which the accident emergency reporting system by this invention detects the accident of a self-vehicle by sensors, such as gravitational acceleration and an inclination of a self-vehicle A self-vehicle position specification means to pinpoint the position of a self-vehicle from sense information, such as GPS, and a gyroscope, a vehicle speed sensor The radio means for communicating on radio in the emergency relief center which carries out the postscript of the emergency intelligence, such as positional information of said self-vehicle, accident information, the vehicles ID made to have memorized further beforehand, and crew ID information Or the vehicles which have at least data, and the data / voice simultaneous transmission means which voice can be transmitted simultaneously, It is the accident emergency reporting system which changes from the emergency relief center which performs the mobilization request of an urgent automobile to the place on which the aforementioned vehicles are put based on the content in response to the aforementioned emergency intelligence. 1st radio-transmission means by which the aforementioned radio means transmits emergency intelligence to the aforementioned emergency relief center in data communication from the aforementioned vehicles at the time of the occurrence of accident, It is characterized by having at least the 2nd radio-transmission means which makes speech communication possible in the aforementioned emergency relief center from the aforementioned vehicles by automatic change at the time of the data communication end by the radio-transmission means of the above 1st.

[0006] Furthermore, it is characterized by enabling it to perform the above-mentioned data communication and the above-mentioned speech communication in concurrency by having data / voice simultaneous transmission means.

[0007] Since the emergency intelligence by data communication is transmitted to an emergency relief center also in the worst state while being able to make the detailed content of accident know correctly, since emergency intelligence is first transmitted in the data communication by radio and automatic switching, or data / voice broadcast is performed subsequently to speech communication by having such composition, the organization of quicker and exact rescue and support can be constructed.

[0008]

[Embodiments of the Invention] An accident detection means by which invention of this invention according to claim 1 detects the accident of a self-vehicle by sensors, such as gravitational acceleration and an inclination of a self-vehicle A self-vehicle position specification means to pinpoint the position of a self-vehicle from sense information, such as GPS, and a gyroscope, a vehicle speed sensor The radio means for communicating on radio in the emergency relief center which carries out the postscript of the emergency intelligence, such as positional information of said self-vehicle, accident information, the vehicles ID made to memorized further beforehand, and crew ID information Or the vehicles which have at least data, and the data / voice simultaneous transmission means which voice can be transmitted simultaneously, It is the accident emergency reporting

system which changes from the emergency relief center which performs the mobilization request of an urgent automobile to the place on which the aforementioned vehicles are put based on the content in response to the aforementioned emergency intelligence. 1st radio-transmission means by which the aforementioned radio means transmits emergency intelligence to the aforementioned emergency relief center in data communication from the aforementioned vehicles at the time of the occurrence of accident, It considers as the accident emergency reporting system characterized by having at least the 2nd radio-transmission means which makes speech communication possible in the aforementioned emergency relief center from the aforementioned vehicles by automatic change at the time of the data communication end by the radio-transmission means of the above 1st. While being able to make the detailed content of accident know correctly, it has operation that the emergency intelligence by data communication can transmit to an emergency relief center also in the worst state.

[0009] Moreover, it has operation that invention according to claim 2 can perform cutting control of a circuit by emergency relief center initiative so that it may make to perform cutting control of a circuit by the aforementioned emergency relief center initiative during data communication and speech communication into the accident emergency reporting system according to claim 1 by which it is characterized and cutting control from an emergency-call-unit side may not be performed for the connected circuit.

[0010] Moreover, invention according to claim 3 will interrupt the speech communication by the radio-transmission means of the above 2nd, if the high data communication demand of a new priority occurs during the speech communication by the radio-transmission means of the above 2nd. It considers as the accident emergency reporting system according to claim 1 characterized by constituting so that data communication by the radio-transmission means of the above 1st may be made possible. After changing to speech communication, it has operation that a re-change can be carried out to data communication to the newly invited situation.

[0011] Moreover, as the aforementioned data / voice broadcast means, invention according to claim 4 considers as the accident emergency reporting system according to claim 1 characterized by constituting by Frequency Division Multiplexing, Time Division Multiplexing, or space division multiplex (spread spectrum method) so that speech communication may also be transmitted simultaneously during data communication, and has operation that speech communication can be quickly started of an operator's will on the occasion of the change to speech communication from data communication.

[0012] Hereafter, the form of operation of this invention is explained based on a drawing.

[0013] Drawing 1 is the block diagram showing the outline composition of the accident emergency reporting system concerning the form of each operation of this invention. In drawing 1 , the accident emergency reporting system is constituted so that the vehicles 1 which carried the emergency call unit which obtains the positional information of a self-vehicle from GPS at least, and was

recorded can notify the urgent emergency center 2 through a network (a base station, switched network) at the time of the occurrence of accident. The urgent emergency center 2 grasps the situation of accident based on the report from vehicles 1, requests mobilization of urgent vehicles from a site from arrangements of a hospital, a nearby police station, and a fire department, and requests corrective action. Moreover, it is made to perform data communication of the safety check of vehicles 2 by data communication, since it is made for the urgent emergency center 2 to offer emergency relief service by the owner and contract of vehicles automatically at least about vehicles 2.

[0014] Drawing 2 shows the outline of the composition of vehicles in which the emergency call unit was carried. An accident detection means 21 by which sensors, such as gravitational acceleration and an inclination of a self-vehicle, detect the accident of a self-vehicle in drawing 2 , A self-vehicle position specification means 22 to pinpoint the position of a self-vehicle from sense information, such as GPS, and a gyroscope, a vehicle speed sensor The positional information of said self-vehicle, accident information, the vehicles ID made to memorized further beforehand It has the radio means 23 for communicating emergency intelligence, such as crew ID information, on radio in the emergency relief center or the data / voice broadcast means 27, the storage means 24 containing ROM or RAM, CPU25, and the power supply 26.

[0015] (Form of the 1st operation) In the composition of the vehicles which carried the above accident emergency reporting systems and emergency call units, the form of operation of the 1st of this invention is explained. As shown in drawing 3 , the radio means is equipped with the antenna 31 and the usual cellular-phone unit (a transmitter/receiver part, cellular-phone book soma concerning the transmission and reception except the antenna section) 32, and is further equipped with the 1st radio-transmission means 33 to which a modem 34 is connected through a circuit changing switch (a postscript is carried out) as the cellular-phone unit 32, and the 2nd radio-transmission means 35 connected to a hand set (or hand free-lancer) 36 through a circuit changing switch (a postscript is carried out). In addition, in drawing 3 , it is shown that a dotted line is controlled by CPU in an emergency call unit.

[0016] Drawing 4 shows the composition of the radio means which the emergency call unit concerning the form of operation of the 1st of this invention constituted and described above more to a detail. In drawing 4 , although the portion and modem portion of a changeover switch of a radio means are contained in the emergency call unit, others are prepared out of the emergency call unit. And CPU41, a flash ROM 42, RAM43, the gyroscope sensor 44, the GPS receiver 45, the rollover sensor 46, the current supply section 47, the modem 48, the changeover switch 49, and the echo canceller 50 are formed in the emergency call unit. Moreover, the ON/OFF information on a key switch, the information on a crash sensor, the information on a speed sensor, etc. are inputted into CPU41.

[0017] Drawing 5 shows the outline composition of the emergency relief center concerning the form of operation of this invention, the emergency relief center is equipped with means of communications 51, the communications control means 52, the database 53, and display/telephone call means 54, and the

communications control means 52 is made to be made by exchange of a database 53 and display/telephone call means 54, and data in it through LAN. Means of communications 51 is connected and connection controlled through a link at the communications control means 52 including the exchange. The database 53 accumulates and holds the customer management data about the owner of vehicles etc., map data, the data about an urgent call, etc.

[0018] Means of communications (exchange) 51 is connected with vehicles via a public wire circuit, a public radio circuit, etc. which a common carrier offers, and reception of the emergency intelligence from vehicles is attained. The communications control means 52 decodes the emergency intelligence at the time of reception of the emergency intelligence from vehicles, takes out time data / position data, accident information, the vehicles ID made to have memorized further beforehand, crew ID information, etc., performs map matching with the map data picked out from the database 53, and displays it on display/telephone call means 54 while it notifies the occurrence of accident to a display/telephone call means 54 to by_which an operator is at his desk. An operator can see the contents of the displayed accident and can construct quick emergency support organization, such as a mobilization request of an urgent automobile, and arrangements of an emergency hospital.

[0019] Next, operation of the accident emergency reporting system of the form of operation of the 1st of this invention is explained.

[0020] The self-vehicle position specification means 22 of drawing 2 acquires a time entry at the same time it acquires positional information from GPS periodically in the GPS receiver 45 so that it may be illustrated by drawing 4 , and it memorizes it to the flash ROM 42 in an emergency call unit. When the rollover sensor 46 senses the operation of the crash sensor by gravitational acceleration joining vehicles 1, and the inclination more than required of vehicles 1, the accident detection means 21 of drawing 2 detects the occurrence of accident, and it memorizes it to a flash ROM 42 while it notifies the occurrence of accident to CPU41 of an emergency call unit.

[0021] CPU41 of the emergency call unit which received the notice of the occurrence of accident The information which the 1st radio-transmission means 33 of drawing 3 was operated, and was memorized about accident to the flash ROM 42, i.e., positional information of vehicles 1, a time entry and the sense information showing the contents of accident from various sensors -- it memorizes to a flash ROM 42 further beforehand -- having -- Vehicles ID -- While making it a predetermined transmission format at the same time it reads crew ID information etc., change a circuit changing switch 49 to a modem side, and a cellular-phone unit and a modem 48 are connected. It transmits in data communication form towards the emergency relief center 2 via a public line through Antenna TEL as emergency intelligence.

[0022] Detection of the end of the data transmission of the emergency intelligence of data communication form of the communications control means 52 of the emergency relief center 2 returns ACK which shows that data were received to vehicles 1. Thereby, CPU41 of the emergency call unit of vehicles 1 connects a cellular-phone unit, a hand set, or a hand free-lancer, and starts speech

communication while it operates the 2nd radio-transmission means 35 of drawing 3 and changes a changeover switch 49 to a hand set or a hand free-lancer automatically.

[0023] It enables it to talk over the telephone by this among the operators who are present at display/telephone call means 54 of the emergency relief center 2 with the crew in vehicles in speech-communication form.

[0024] If the communication sequence about the above is illustrated, it can express like drawing 6 .

[0025] If the state where data communication should be carried out by generating of the high situation of a priority new the midst of the speech communication by speech-communication form is detected, CPU41 of an emergency call unit can operate the 1st radio-transmission means 33 again, and can also transmit emergency intelligence again in data communication form.

[0026] In the emergency relief center 2, the emergency intelligence transmitted in data communication form is received with a communications control means 52 to control the exchange through the 51 casks of means-of-communications exchange. The communications control means 52 is controlled to be able to perform cutting control of a circuit by communications control means 52 initiative while decoding the emergency intelligence first transmitted in data communication form and specifying the contents of accident. It displays on display/telephone call means 54, decoding the current position of the vehicles which accident generated, time, the operation situation of an accident sensor, Vehicles ID, Crew ID, etc., and carrying out map matching of it on the map data from a database 53 after that.

[0027] Subsequently, the end of data communication form is detected with the communications control means 52, and ACK is returned to emergency relief center side empty-vehicle both sides. CPU41 by the side of vehicles detects this ACK, in a vehicles side, the 2nd radio-transmission means 35 is operated and an automatic change is carried out to speech communication. Moreover, in an emergency relief center side, means of communications 51 changes to an extension, and carries out the telephone call by speech-communication form with the crew of vehicles by operator telephone. Since it comes to be able to perform a voice telephone call automatically among the crews of vehicles, an accident situation can be complemented, and a more exact accident situation can be grasped.

[0028] The emergency relief central site operator who has grasped the accident situation as mentioned above looks at the contents displayed on display/telephone call means 54, and he performs generating prevention of a secondary calamity, arrangements of a hospital, etc. while he performs the mobilization request of urgent automobiles, such as a police car and an ambulance, in the place on which vehicles are put through means of communications 51.

[0029] (Form of the 2nd operation) The form of operation of the 2nd of this invention is hereafter explained based on a drawing. Since it has already explained, the composition of the vehicles and emergency relief center in which the accident emergency reporting system and the emergency call unit were carried is not re-explained here. In addition, explanation is omitted about the same composition as the form of the 1st operation.

[0030] As shown in drawing 7 , it has the antenna 31 and the usual cellular-phone

unit (a transmitter/receiver part, cellular-phone book soma concerning the transmission and reception except the antenna section) 32, and the cellular-phone unit 32 is further connected to a speed conversion and the command-processing section 38 through data / voice simultaneous transmission means 37, and data / voice broadcast means can be connected with a hand set (or hand free-lancer) 36 through data / voice simultaneous transmission means 37.

[0031] Although there is various the technique of realizing data / voice broadcast, some examples are explained briefly. There is frequency division multiplexing as the 1st technique. This method is further divided into (a) DTME method and (b) FSK method. And (a) DTME method superimposes data transmission by the low speed by DTME (Dual ToneMulti-Frequency) in the usual voice transmission mode. On the other hand, (b) FSK method superimposes the data transmission of a low speed by FSK (Frequency Shift Keying) in the usual voice transmission mode.

[0032] Next, there is time division multiplexing as 2nd technique. This method is realized by using it with data and voice, dividing into 4800 bitses at a time the circuit which can transmit the data of 9600bits(es) as a data transmission rate. In this case, of course, CODEC of a low bit rate of about 4.8 kb/s (coding/decryption machine) is needed for voice transmission. moreover, a voice telephone call -- general -- about -- since only 1/3 is occupied -- about [remaining] -- since silent time is not fixed, rate adaptation processing of a flow control etc. is needed, and since there is silent time two thirds, although data transmission can be performed also at the time, it is necessary to prepare a silent detecting element in a voice portion for the reason, or to prepare rate adaptation and the command-processing section in the data transmission section

[0033] Furthermore as the 3rd technique, there is a space division multiplex (spread spectrum method) method. this method -- usually -- coming out -- since it is a cellular-phone method as a CDMA method, it has already realized and a transmission band can improve by leaps and bounds, data/not only voice but image data can be transmitted -- it becomes like

[0034] In addition, the above-mentioned "command processing" is processing for generally controlling the mode of operation of MODEM(s), such as transmission speed, such as an AT command set carried in MODEM, an error detection correction method, and a method of a flow control, by the command, and this processing itself is known well.

[0035] Drawing 8 shows the composition of the data / voice broadcast means which the emergency call unit concerning the form of operation of the 2nd of this invention constituted and described above more to a detail. In drawing 8 , although data / voice simultaneous transmission means, a changeover switch, and a speed conversion and the command-processing section are contained in the emergency call unit, others are prepared out of the emergency call unit. And CPU41, a flash ROM 42, RAM43, the gyroscope sensor 44, the GPS receiver 45, the rollover sensor 46, the current supply section 47, an echo canceller 50, the data / voice simultaneous transmission means 55, and a speed conversion and the command-processing section 56 are formed in the emergency call unit. Moreover, the ON/OFF information on a key switch, the information on a crash sensor, the information on a speed sensor, etc. are inputted into CPU41.

[0036] Next, operation of the accident emergency reporting system of the form of operation of the 2nd of this invention is explained.

[0037] The self-vehicle position specification means 22 of drawing 2 acquires a time entry at the same time it acquires positional information from GPS periodically in the GPS receiver 45 so that it may be illustrated by drawing 8 , and it memorizes it to the flash ROM 42 in an emergency call unit. When the rollover sensor 46 senses the operation of the crash sensor by gravitational acceleration joining vehicles 1, and the inclination more than required of vehicles 1, the accident detection means 21 of drawing 2 detects the occurrence of accident, and it memorizes it to a flash ROM 42 while it notifies the occurrence of accident to CPU41 of an emergency call unit.

[0038] CPU41 of the emergency call unit which received the notice of the occurrence of accident The information which the speed conversion and the command-processing section 38 of drawing 7 were operated, and was memorized about accident to the flash ROM 42, i.e., positional information of vehicles 1, a time entry and the sense information showing the contents of accident from various sensors -- it memorizes to a flash ROM 42 further beforehand -- having -- Vehicles ID -- A cellular-phone unit, and a speed conversion and the command-processing section 38 are connected at the same time it reads crew ID information etc., and it transmits in data communication form towards the emergency relief center 2 via a public line through Antenna TEL as emergency intelligence.

[0039] Detection of the end of the data transmission of the emergency intelligence of data communication form of the communications control means 52 of the emergency relief center 2 returns ACK which shows that data were received to vehicles 1. Thereby, CPU41 of the emergency call unit of vehicles 1 connects a cellular-phone unit, a hand set, or a hand free-lancer, and starts speech communication while changing it to the hand set or hand free-lancer of drawing 7 automatically.

[0040] It enables it to talk over the telephone by this among the operators who are present at display/telephone call means 54 of the emergency relief center 2 with the crew in vehicles in speech-communication form.

[0041] If the communication sequence about the above is illustrated, it can express like already explained drawing 6 .

[0042] If the state where data communication should be carried out by generating of the high situation of a priority new the midst of the speech communication by speech-communication form is detected, CPU41 of an emergency call unit can operate a speed conversion and the command-processing section 38, and can also transmit emergency intelligence again in data communication form.

[0043] In the emergency relief center 2, the emergency intelligence transmitted in data communication form is received with a communications control means 52 to control the exchange through the 51 casks of means-of-communications exchange. The communications control means 52 is controlled to be able to perform cutting control of a circuit by communications control means 52 initiative while decoding the emergency intelligence first transmitted in data communication form and specifying the contents of accident. It displays on display/telephone call means 54, decoding the current position of the vehicles which accident generated,

time, the operation situation of an accident sensor, Vehicles ID, Crew ID, etc., and carrying out map matching of it on the map data from a database 53 after that.

[0044] Subsequently, the end of data communication form is detected with the communications control means 52, and ACK is returned to emergency relief center side empty-vehicle both sides. CPU41 by the side of vehicles detects this ACK, in a vehicles side, the 2nd radio-transmission means 35 is operated and an automatic change is carried out to speech communication. Moreover, in an emergency relief center side, means of communications 51 changes to an extension, and carries out the telephone call by speech-communication form with the crew of vehicles by operator telephone. Since it comes to be able to perform a voice telephone call automatically among the crews of vehicles, an accident situation can be complemented, and a more exact accident situation can be grasped.

[0045] The emergency relief central site operator who has grasped the accident situation as mentioned above looks at the contents displayed on display/telephone call means 54, and he performs generating prevention of a secondary calamity, arrangements of a hospital, etc. while he performs the mobilization request of urgent automobiles, such as a police car and an ambulance, in the place on which vehicles are put through means of communications 51.

[0046] In addition, although the form of the above-mentioned 1st and the 2nd operation explained what the radio means 23 for communicating on radio in the emergency relief center, and the data / voice broadcast means 27 equip with emergency intelligence, such as the vehicles ID which were shown in drawing 2 , and which are made to have memorized beforehand, and crew ID information, alternatively It has the two above-mentioned means of communications simultaneously, and you may enable it to choose the either freely by mode change.

[0047]

[Effect of the Invention] While being able to make the detailed contents of accident know correctly as explained above according to the accident emergency reporting system of this invention, it is effective in the ability of the emergency intelligence by data communication to transmit to an emergency relief center also in the worst state.

[0048] Moreover, according to the accident emergency reporting system of this invention, after changing to speech communication, it is effective in the ability to carry out a re-change to data communication to the newly invited situation.

[0049] Moreover, according to the accident emergency reporting system of this invention, since data communication and speech communication can be carried out simultaneously, it is effective in the ability to respond quickly in speech communication to the newly invited situation.

[Translation done.]

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TECHNICAL FIELD

[The technical field to which invention belongs] With respect to an accident emergency reporting system, after transmission of the emergency intelligence by data communication, especially this invention performs speech communication by automatic change, or it constitutes it so that data / voice broadcast may be made possible.

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PRIOR ART

[Description of the Prior Art] Even when communication with the exterior by the operator becomes impossible in the accident of vehicles, such as an automobile, etc. conventionally, the emergency reporting system which can transmit unusual generating outside with the position of vehicles is indicated by JP,9-198592,A. According to it, a self-position is measured for every predetermined time using the navigation system which measures a self-position based on the positional information from GPS. The measurement value and measurement time are memorized for a storage means, and when the abnormalities of vehicles are detected with a malfunction detection means, it constitutes so that the unusual generating message created based on the newest measurement value and newest measurement time which were memorized for the storage means may be sent out to the receiving set which was able to be defined beforehand via a radio dial-up line.

[0003] This system had a problem of the ability not to make the detailed contents of accident know correctly only by carrying out data communication of the newest unusual generating message created based on the time data which memorized self-position data and the self-position to a predetermined information addressee.

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EFFECT OF THE INVENTION

[Effect of the Invention] While being able to make the detailed contents of accident known correctly as explained above according to the accident emergency reporting system of this invention, it is effective in the ability of the emergency intelligence by data communication to transmit to an emergency relief center also in the worst state.

[0048] Moreover, according to the accident emergency reporting system of this invention, after changing to speech communication, it is effective in the ability to carry out a re-change to data communication to the newly invited situation.

[0049] Moreover, according to the accident emergency reporting system of this invention, since data communication and speech communication can be carried out simultaneously, it is effective in the ability to respond quickly in speech communication to the newly invited situation.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] then, when the purpose of this invention cancels the above-mentioned trouble and emergency occurs on vehicles in accident etc. First The positional information of a self-vehicle, accident information, the vehicles ID made to have memorized further beforehand Perform data communication according emergency intelligence, such as crew ID information, to radio in the emergency relief center, and change to speech communication automatically at the time of the data communication end, or data / voice broadcast means is used. It is in offering the accident emergency reporting system which can make an emergency relief center know the detailed contents of accident.

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MEANS

[Means for Solving the Problem] An accident detection means by which the accident emergency reporting system by this invention detects the accident of a self-vehicle by sensors, such as gravitational acceleration and an inclination of a self-vehicle A self-vehicle position specification means to pinpoint the position of a self-vehicle from sense information, such as GPS, and a gyroscope, a vehicle speed sensor The radio means for communicating on radio in the emergency relief center which carries out the postscript of the emergency intelligence, such as positional information of said self-vehicle, accident information, the vehicles ID made to have memorized further beforehand, and crew ID information Or the vehicles which have at least data, and the data / voice simultaneous transmission means which voice can be transmitted simultaneously, It is the accident emergency reporting system which changes from the emergency relief center which performs the mobilization request of an urgent automobile to the place on which the aforementioned vehicles are put based on the content in response to the aforementioned emergency intelligence. 1st radio-transmission means by which the aforementioned radio means transmits emergency intelligence to the aforementioned emergency relief center in data communication from the aforementioned vehicles at the time of the occurrence of accident, It is characterized by having at least the 2nd radio-transmission means which makes speech communication possible in the aforementioned emergency relief center from the aforementioned vehicles by automatic change at the time of the data communication end by the radio-transmission means of the above 1st.

[0006] Furthermore, it is characterized by enabling it to perform the above-mentioned data communication and the above-mentioned speech communication in concurrency by having data / voice simultaneous transmission means.

[0007] Since the emergency intelligence by data communication is transmitted to an emergency relief center also in the worst state while being able to make the detailed content of accident know correctly, since emergency intelligence is first transmitted in the data communication by radio and automatic switching, or data / voice broadcast is performed subsequently to speech communication by having such composition, the organization of quicker and exact rescue and support can be constructed.

[0008]

[Embodiments of the Invention] An accident detection means by which invention

of this invention according to claim 1 detects the accident of a self-vehicle by sensors, such as gravitational acceleration and an inclination of a self-vehicle. A self-vehicle position specification means to pinpoint the position of a self-vehicle from sense information, such as GPS, and a gyroscope, a vehicle speed sensor. The radio means for communicating on radio in the emergency relief center which carries out the postscript of the emergency intelligence, such as positional information of said self-vehicle, accident information, the vehicle's ID made to memorized further beforehand, and crew ID information. Or the vehicles which have at least data, and the data / voice simultaneous transmission means which voice can be transmitted simultaneously. It is the accident emergency reporting system which changes from the emergency relief center which performs the mobilization request of an urgent automobile to the place on which the aforementioned vehicles are put based on the content in response to the aforementioned emergency intelligence. 1st radio-transmission means by which the aforementioned radio means transmits emergency intelligence to the aforementioned emergency relief center in data communication from the aforementioned vehicles at the time of the occurrence of accident. It considers as the accident emergency reporting system characterized by having at least the 2nd radio-transmission means which makes speech communication possible in the aforementioned emergency relief center from the aforementioned vehicles by automatic change at the time of the data communication end by the radio-transmission means of the above 1st. While being able to make the detailed content of accident known correctly, it has operation that the emergency intelligence by data communication can transmit to an emergency relief center also in the worst state.

[0009] Moreover, it has operation that invention according to claim 2 can perform cutting control of a circuit by emergency relief center initiative so that it may make to perform cutting control of a circuit by the aforementioned emergency relief center initiative during data communication and speech communication into the accident emergency reporting system according to claim 1 by which it is characterized and cutting control from an emergency-call-unit side may not be performed for the connected circuit.

[0010] Moreover, invention according to claim 3 will interrupt the speech communication by the radio-transmission means of the above 2nd, if the high data communication demand of a new priority occurs during the speech communication by the radio-transmission means of the above 2nd. It considers as the accident emergency reporting system according to claim 1 characterized by constituting so that data communication by the radio-transmission means of the above 1st may be made possible. After changing to speech communication, it has operation that a re-change can be carried out to data communication to the newly invited situation.

[0011] Moreover, as the aforementioned data / voice broadcast means, invention according to claim 4 considers as the accident emergency reporting system according to claim 1 characterized by constituting by Frequency Division Multiplexing, Time Division Multiplexing, or space division multiplex (spread spectrum method) so that speech communication may also be transmitted

simultaneously during data communication, and has operation that speech communication can be quickly started of an operator's volition on the occasion of the change to speech communication from data communication.

[0012] Hereafter, the gestalt of operation of this invention is explained based on a drawing.

[0013] Drawing 1 is the block diagram showing the outline composition of the accident emergency reporting system concerning the gestalt of each operation of this invention. In drawing 1, the accident emergency reporting system is constituted so that the vehicles 1 which carried the emergency call unit which obtains the positional information of a self-vehicle from GPS at least, and was recorded can notify the urgent emergency center 2 through a network (a base station, switched network) at the time of the occurrence of accident. The urgent emergency center 2 grasps the situation of accident based on the report from vehicles 1, requests mobilization of urgent vehicles from a site from arrangements of a hospital, a nearby police station, and a fire department, and requests corrective action. Moreover, it is made to perform data communication of the safety check of vehicles 2 by data communication, since it is made for the urgent emergency center 2 to offer emergency relief service by the owner and contract of vehicles automatically at least about vehicles 2.

[0014] Drawing 2 shows the outline of the composition of vehicles in which the emergency call unit was carried. An accident detection means 21 by which sensors, such as gravitational acceleration and an inclination of a self-vehicle, detect the accident of a self-vehicle in drawing 2, A self-vehicle position specification means 22 to pinpoint the position of a self-vehicle from sense information, such as GPS, and a gyroscope, a vehicle speed sensor The positional information of said self-vehicle, accident information, the vehicles ID made to memorized further beforehand It has the radio means 23 for communicating emergency intelligence, such as crew ID information, on radio in the emergency relief center or the data / voice broadcast means 27, the storage means 24 containing ROM or RAM, CPU25, and the power supply 26.

[0015] (Gestalt of the 1st operation) In the composition of the vehicles which carried the above accident emergency reporting systems and emergency call units, the gestalt of operation of the 1st of this invention is explained. As shown in drawing 3, the radio means is equipped with the antenna 31 and the usual cellular-phone unit (a transmitter/receiver part, cellular-phone book soma concerning the transmission and reception except the antenna section) 32, and is further equipped with the 1st radio-transmission means 33 to which a modem 34 is connected through a circuit changing switch (a postscript is carried out) as the cellular-phone unit 32, and the 2nd radio-transmission means 35 connected to a hand set (or hand free-lancer) 36 through a circuit changing switch (a postscript is carried out). In addition, in drawing 3, it is shown that a dotted line is controlled by CPU in an emergency call unit.

[0016] Drawing 4 shows the composition of the radio means which the emergency call unit concerning the gestalt of operation of the 1st of this invention constituted and described above more to a detail. In drawing 4, although the portion and modem portion of a changeover switch of a radio means are contained in the

emergency call unit, others are prepared out of the emergency call unit. And CPU41, a flash ROM 42, RAM43, the gyroscope sensor 44, the GPS receiver 45, the rollover sensor 46, the current supply section 47, the modem 48, the changeover switch 49, and the echo canceller 50 are formed in the emergency call unit. Moreover, the ON/OFF information on a key switch, the information on a crash sensor, the information on a speed sensor, etc. are inputted into CPU41.

[0017] Drawing 5 shows the outline composition of the emergency relief center concerning the gestalt of operation of this invention, the emergency relief center is equipped with means of communications 51, the communications control means 52, the database 53, and display/telephone call means 54, and the communications control means 52 is made to be made by exchange of a database 53 and display/telephone call means 54, and data in it through LAN. Means of communications 51 is connected and connection controlled through a link at the communications control means 52 including the exchange. The database 53 accumulates and holds the customer management data about the owner of vehicles etc., map data, the data about an urgent call, etc.

[0018] Means of communications (exchange) 51 is connected with vehicles via a public wire circuit, a public radio circuit, etc. which a common carrier offers, and reception of the emergency intelligence from vehicles is attained. The communications control means 52 decodes the emergency intelligence at the time of reception of the emergency intelligence from vehicles, takes out time data / position data, accident information, the vehicles ID made to have memorized further beforehand, crew ID information, etc., performs map matching with the map data picked out from the database 53, and displays it on display/telephone call means 54 while it notifies the occurrence of accident to a display/telephone call means 54 to by_which an operator is at his desk. An operator can see the content of the displayed accident and can construct quick emergency support organization, such as a mobilization request of an urgent automobile, and arrangements of an emergency hospital.

[0019] Next, operation of the accident emergency reporting system of the gestalt of operation of the 1st of this invention is explained.

[0020] The self-vehicle position specification means 22 of drawing 2 acquires a time entry at the same time it acquires positional information from GPS periodically in the GPS receiver 45 so that it may be illustrated by drawing 4 , and it memorizes it to the flash ROM 42 in an emergency call unit. When the rollover sensor 46 senses the operation of the crash sensor by gravitational acceleration joining vehicles 1, and the inclination more than required of vehicles 1, the accident detection means 21 of drawing 2 detects the occurrence of accident, and it memorizes it to a flash ROM 42 while it notifies the occurrence of accident to CPU41 of an emergency call unit.

[0021] CPU41 of the emergency call unit which received the notice of the occurrence of accident The information which the 1st radio-transmission means 33 of drawing 3 was operated, and was memorized about accident to the flash ROM 42, i.e., positional information of vehicles 1, a time entry and the sense information showing the content of accident from various sensors -- it memorizes to a flash ROM 42 further beforehand -- having -- Vehicles ID -- While making it a

predetermined transmission format at the same time it reads crew ID information etc., change a circuit changing switch 49 to a modem side, and a cellular-phone unit and a modem 48 are connected. It transmits in data communication form towards the emergency relief center 2 via a public line through Antenna TEL as emergency intelligence.

[0022] Detection of the end of the data transmission of the emergency intelligence of data communication form of the communications control means 52 of the emergency relief center 2 returns ACK which shows that data were received to vehicles 1.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The block diagram showing the outline composition of the accident emergency reporting system of the gestalt of each operation of this invention,

[Drawing 2] The block diagram showing the outline of the composition of vehicles in which the emergency call unit concerning the gestalt of each operation of this invention was carried,

[Drawing 3] The block diagram showing the composition of the radio means concerning the gestalt of operation of the 1st of this invention,

[Drawing 4] The configuration block view having shown more the composition of the emergency call unit concerning the gestalt of operation of the 1st of this invention, and the composition of a radio means in the detail,

[Drawing 5] The block diagram showing the outline composition of the emergency relief center concerning the gestalt of each operation of this invention,

[Drawing 6] Drawing showing the communication sequence between the emergency call units and emergency relief centers concerning the gestalt of each operation of this invention,

[Drawing 7] The block diagram showing the composition of the data / voice broadcast means concerning the gestalt of operation of the 2nd of this invention,

[Drawing 8] It is the configuration block view having shown more the composition of the emergency call unit concerning the gestalt of operation of the 2nd of this invention, and the composition of data / voice broadcast means in the detail.

[Description of Notations]

1 Vehicles Which Carried Emergency Call Unit

2 Emergency Relief Center

21 Accident Detection Means

22 Self-Vehicle Position Specification Means

23 Radio Means

24 Storage Means

25 41 CPU

26 Power Supply

27 Data / Voice Broadcast Means

31 ANT

32 Cellular-Phone Unit

33 1st Radio-Transmission Means

34 48 Modem
35 2nd Radio-Transmission Means
36 Hand Set/Handsfree
37 55 Data / voice simultaneous transmission means
38 56 A speed conversion and the command-processing section
42 Flash ROM
43 RAM
44 Gyroscope Sensor
45 GPS Receiver
46 Rollover Sensor
47 Current Supply Section
49 Changeover Switch
50 Echo Canceller
51 Means of Communications
52 Communications Control Means
53 Database
54 Display/Telephone Call Means

[Translation done.]

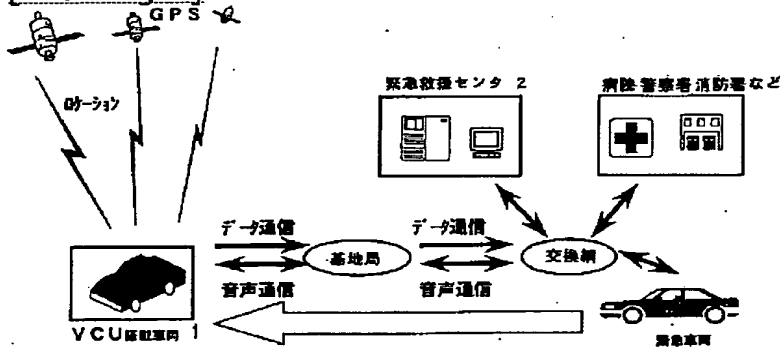
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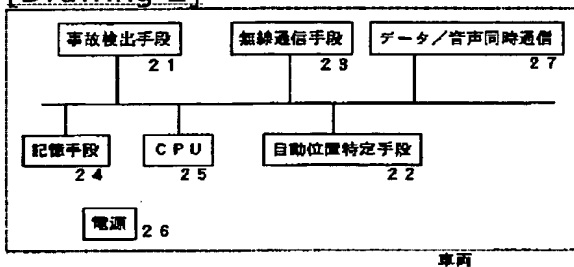
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DRAWINGS

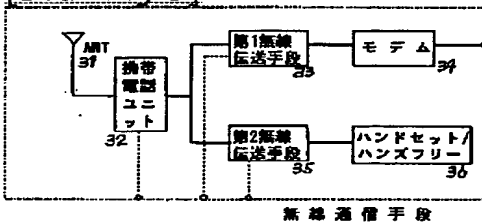
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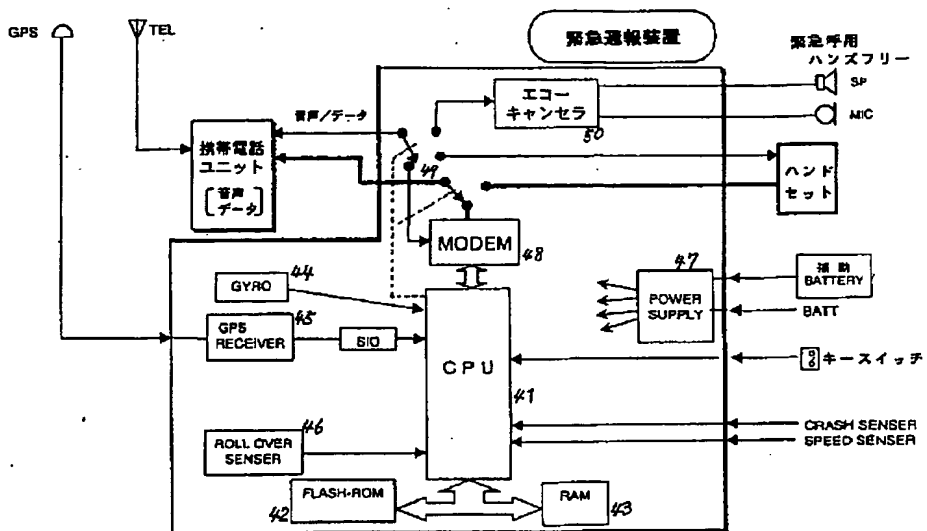
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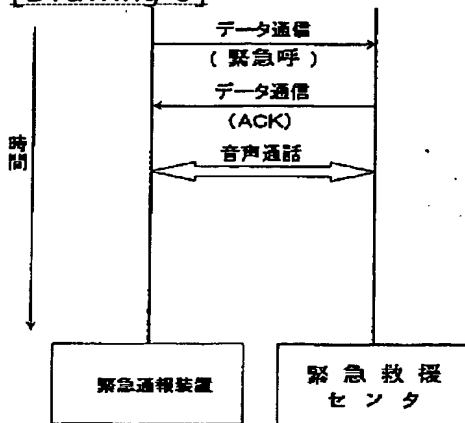
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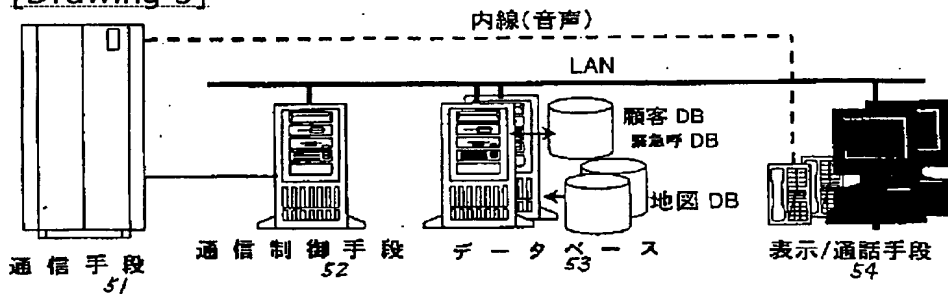
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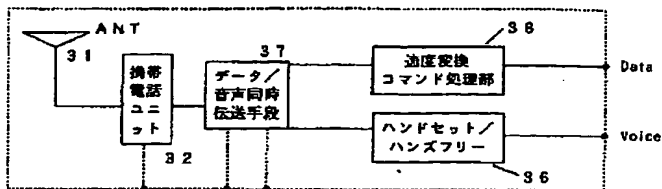
[Drawing 6]



[Drawing 5]

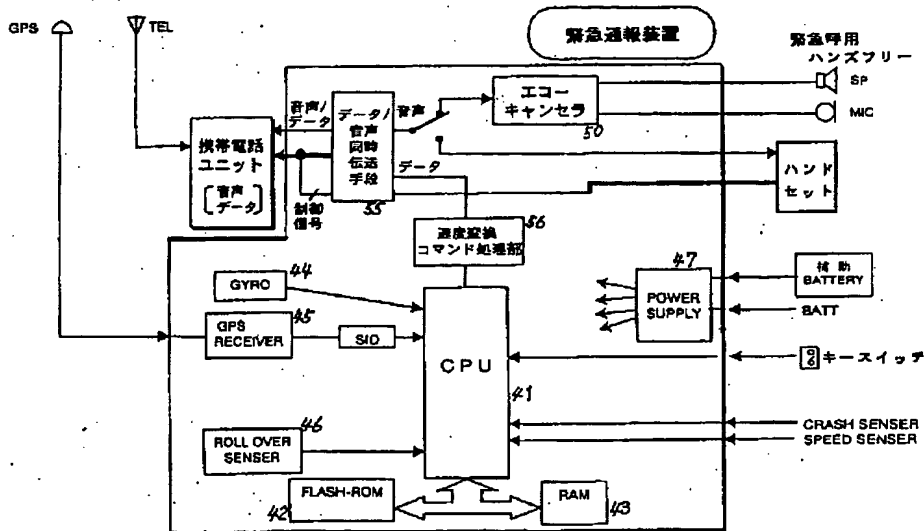


[Drawing 7]



データ/音声同時伝送手段

[Drawing 8]



[Translation done.]